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# ADJUSTABLE MERCHANDISE SECURITY CONTAINER

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# ADJUSTABLE MERCHANDISE SECURITY CONTAINER

## FIELD OF THE INVENTION

[0001] Embodiments of the present invention relate generally to merchandise display security devices and methods for protecting an item of merchandise from theft.

## BACKGROUND OF THE INVENTION

[0002] It is common practice for retailers to store and/or display relatively expensive items of merchandise on or within a merchandise security device, such as a security display (e.g. alarming stand), security fixture (e.g. locking hook, shelf, cabinet, etc.) or security packaging (e.g. merchandise safer). Regardless, the merchandise security device displays and/or stores an item of merchandise so that a potential purchaser may view, and in some instances, interact with the merchandise before making a decision whether to purchase the item. At the same time, the item is secured on or within the merchandise security device so as to prevent, or at least deter, theft of the item. The value of the item, however, may make it an attractive target for a shoplifter despite the presence of a merchandise security device. A determined shoplifter may attempt to detach the item from the security display, or attempt to remove the item from the security fixture or from the security packaging. Alternatively, the shoplifter may attempt to remove the security device, or at least a portion thereof, from the display area along with the item.

## BRIEF SUMMARY

[0003] Embodiments of the present invention are directed towards merchandise security devices and methods for securing items of merchandise from theft. In one embodiment, a merchandise security device may include a housing comprising a first portion and a second portion defining an interior for retaining an item of merchandise therebetween, the first and second portions being movable relative to one another for adjusting a distance between the first and second portions. The merchandise security device also includes a cable configured to operably engage each of the first and second portions and a lock mechanism configured to secure the cable relative to the housing to thereby secure the first and second portions relative to one another. Thus, embodiments of the present invention differ from conventional “safers” or boxes

that are fixed in size and not adjustable.

[0004] In another embodiment, a method includes inserting an item of merchandise within an interior defined by a first portion and a second portion of a housing, the first and second portions operably engaged with one another with a cable. The method further includes moving the first and second portions relative to one another for adjusting a distance between the first and second portions, and locking a lock mechanism to secure the cable relative to the housing to thereby secure the first and second portions relative to one another.

## BRIEF DESCRIPTION OF THE DRAWINGS

[0005] FIG. 1 is a perspective view of a merchandise security device according to one embodiment.

[0006] FIG. 2 is a perspective view of a merchandise security device according to one embodiment prior to securing a cable and adjusting a width of a housing.

[0007] FIG. 3 is a front view of a merchandise security device including a lock mechanism according to one embodiment.

[0008] FIG. 4 is a side view of a merchandise security device according to one embodiment.

[0009] FIG. 5 is a front view of the merchandise security device of FIG. 2 after adjusting the width of the housing.

[0010] FIG. 6 is a bottom perspective view of the merchandise security device of FIG. 5.

[0011] FIG. 7 is a perspective view of a merchandise security device according to one embodiment.

[0012] FIG. 8 is a perspective view of the merchandise security device of FIG. 7 with the first and second portions of the housing separated from one another.

[0013] FIG. 9 is a side view of a merchandise security device of FIG. 7.

[0014] FIG. 10 is an exploded view of a merchandise security device of FIG. 7.

## DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

[0015] Referring now to the accompanying drawing figures wherein like reference numerals denote like elements throughout the various views, one or more embodiments of a merchandise display security device are shown. FIG. 1 illustrates a merchandise security device 10 according

to one embodiment of the invention. The security device 10 includes a container or housing 12 defining a generally hollow interior compartment configured to receive an item of merchandise M therein. In one embodiment, the security device 10 also includes a lock mechanism 14, a cable 16, and/or a tightening mechanism 18 that are configured to allow for adjustment of the size of the housing as discussed in further detail below.

[0016] The housing 12 may be formed of any desired material such as a clear polymeric material so that an item of merchandise and its associated labeling and other marketing information can be seen through the housing. The material of the housing 12 may be rigid or flexible. The housing 12 may be any desired shape, such as a housing with at least a front surface and a rear surface extending from a bottom end to a top end. It is noted that use of the terms "bottom", "front", "rear", and "top" are not intended to be limiting and will depend on the orientation of the housing 12. In addition, it is understood that the top and/or bottom edges or surfaces may include flat or curved surfaces. In other embodiments, the housing 12 may include an EAS tag or the like that is configured to cause an alarm if the housing is attempted to be removed from a retail store. Moreover, the housing 12 may include a hang tag 30 or like feature for receiving a display rod for hanging one or more security devices 10 on the display rod. The hang tag 30 may be integrated with the housing 12 or attached thereto. For example, FIG. 7 shows that the hang tag 30 may be in the form of an opening extending through the housing 12.

[0017] In one embodiment, the housing 12 may include a first portion 12A and a second portion 12B that are connected by a cable 16. The first portion 12A and the second portion 12B are movable relative to one another to adjust a distance therebetween to accommodate items of merchandise having different thicknesses or depths (e.g., the "Z" direction as shown in FIG. 1). It is understood that the housing 12 may include any number of portions, including one or more portions for receiving an item of merchandise M. It is also understood that the first portion 12A and the second portion 12B may be adjusted a variety of desired distances relative to one another. In one example, the first 12A and second 12B portions are adjustable about 1-2 inches relative to one another.

[0018] In some embodiments, the first portion 12A and/or the second portion 12B may define sidewalls or edges. For example, FIGS. 7-10 illustrate embodiments where each of the first 12A

and second 12B portions have sidewalls 20, top edges 22, and bottom edges 24. The sidewalls and top and bottom edges may be configured to retain the item of merchandise M in the housing 12. For instance, each of the first 12A and second 12B portions may include sidewalls and top and bottom edges that are configured to cooperate with one another to retain the item of merchandise M within the housing and/or to prevent access to the cable 16. In some cases, the sidewalls, top edges, and/or bottom edges may be configured to overlap and/or engage with one another at a variety of distances relative to one another. Moreover, the sidewalls, top edges, and/or bottom edges may include one or more channels, hooks, clips, and/or guides for guiding the cable 16 through the first 12A and/or second 12B portions. For instance, FIGS. 2 and 8 show that each of the first 12A and second 12B portions may include one or more longitudinal channels 32 for receiving the cable 16. The cable 16 may be routed through and between the first portion 12A and the second 12B in various manners such as in an alternating "stitching" pattern. It is understood that either the first portion 12A or the second portion 12B may be configured to operably engage the cable 16.

[0019] In addition, FIG. 10 shows that the housing 12 may include one or more modular components. For instance, the first portion 12A and/or the second portion 12B may include a front panel that is configured to operably engage sidewalls, top edges, and/or bottom edges that allow for different sizes of front panels to be used depending on the size of the item of merchandise. The front panels, sidewalls, top edges, and/or bottom edges may be secured to one another using any variety of techniques, such as mechanical engagement, ultrasonic welding, or the like.

[0020] The cable 16 may be any suitable cable, cord, tether, chain, or like member that is configured to operably engage the housing 12. There may be a single cable 16 used or two or more cables used in other embodiments. In some embodiments, the cable 16 is flexible so as to allow the cable to conform to the shape of the housing 12. The cable 16 may include a cut-resistant material in some cases. In another example, the cable 16 may include one or more electrical conductors that are configured to detect cutting or removal of the cable. In this embodiment, the security device may include circuitry for detecting such cutting or removal of the cable, such as by detecting an interruption of a sense loop defined by the conductor(s)

extending through the cable.

[0021] As discussed above, the housing 12 may be adjustable in some embodiments. For example, a distance between the first portion 12A and the second portion 12B may be configured to be increased or decreased depending on the tension applied to the cable 16. In some cases, the tension of the cable 16 may be adjusted manually by a user, such as by pulling on one end or both ends of the cable. Thus, increasing tension in one direction may cause the first portion 12A and the second portion 12B to move towards one another while increasing tension in an opposite direction may cause the first and second portions to move away from one another. In other embodiments, a tightening mechanism 18 may be used to change the tension of the cable 18. For example, the exploded view of FIG. 10 shows an example of a tightening mechanism 18 in the form of a spool whereby the cable 16 is configured to wind on and off of the spool. A user may be able to manually wind or unwind the cable 16 by rotating the spool in a clockwise or counterclockwise direction.

[0022] In one embodiment, a lock mechanism 14 is employed to secure the cable 16 relative to the housing 12. When the lock mechanism 14 is engaged with the cable 16, the item of merchandise cannot be removed from the housing without damaging the security device 10 or removing the cable. The lock mechanism 14 may be configured to removably engage the housing 12 in some embodiments, while in other embodiments the lock mechanism may be attached to integrated with the housing 12, such as either of the first 12A or second 12B portions.

[0023] The lock mechanism 14 may be any suitable mechanism configured to secure the cable 16 in position so that the first portion 12A and the second portion 12B cannot move relative to one another without first unlocking the lock mechanism. For example, a clamp could be used in some cases to secure the cable 16, or the cable could be tied into a knot in one basic implementation. In other cases, a key 40 may be required in order to lock and/or unlock the lock mechanism 14. In some embodiments, a mechanical, magnetic, or electronic key may be used to lock and/or unlock the lock mechanism 14. For example, the key may operate similar to that disclosed in U.S. Patent No. 9,858,778, entitled Programmable Security System and Method for Protecting Merchandise, the contents of which are incorporated herein by reference.

[0024] Any number of lock mechanisms 14 may be employed in conjunction with various

forms of power transfer (e.g., electrical, inductive, capacitive, etc.). For example, where the lock mechanism 14 includes a shape memory material, a change in shape of the shape memory material may cause mechanical actuation (e.g., linear and/or rotary movement) of the lock mechanism. The shape memory material may be operably engaged with the lock mechanism 14 in any number of configurations to facilitate such actuation. Moreover, the shape memory material may be any suitable material, such as a metal, a polymer, or a combination thereof, that is configured to change its shape (e.g., length, area, etc.) in response to an electric current or a change in temperature and to return to its original shape after the electric current is no longer transferred therethrough. For example, transferring current through the shape memory material may cause the material to be heated and thereby contract. Upon removal of the current, the shape memory material may return to its original shape. In addition, other mechanisms may be utilized for actuating, including mechanical, electrical, and/or chemical state changes. As such, the security devices 10 and associated lock mechanisms 14 should not be limited in light of the embodiments shown and described herein. In some embodiments, the lock mechanism may operate similar to that disclosed in U.S. Patent No. 9,428,938, entitled Merchandise Security Devices for Use with an Electronic Key, the contents of which are incorporated herein by reference.

[0025] FIGS. 11-22 show another embodiment of security device 10'. In this regard, FIGS. 20-22 illustrate the security device in a locked state with no item of merchandise M present whereas FIGS. 18-19 show the security device securing an item of merchandise therein. As before, the security device 10' is adjustable depending on the size of the item of merchandise M via first 12A and second 12B portions of a housing 12 connected by a cable 16. In this particular embodiment, a lock mechanism 14' is provided that is operably engaged with either of the first 12A or second 12B portions. The lock mechanism 14' is configured to engage the tightening mechanism 18' in a locked state to allow the cable to be tightened about the item of merchandise M, and to disengage the tightening mechanism in an unlocked state to allow the cable to be loosened. In one embodiment, the lock mechanism 14' includes a latch 42, and the tightening mechanism 18' includes a handle 44. The latch 42 and the handle 44 may be configured to be actuated in response to communication between the lock mechanism 14' and an electronic key

40. FIGS. 11-12 show an example where the latch 42 and handle 44 have been disengaged in response to communication by an electronic key 40, which illustrates that the latch and handle may move from a position within the lock mechanism 14' in a locked state to an extended position external to the lock mechanism in an unlocked state. In the unlocked state, the first 12A and second 12B portions are configured to be moved relative to one another for accommodating a particular item of merchandise M therebetween (see, e.g., FIG. 13). Once the housing 12 has been adjusted accordingly, a user may reengage the latch 42, such as be pressing the latch inwardly within the lock mechanism 14' (see, e.g., FIG. 14). When the latch 42 is engaged with the lock mechanism 14', the handle 44 is configured to be rotated to adjust and tighten the length of the cable 16 so that the first 12A and second 12B portions are secured around the item of merchandise M (e.g., compare FIG. 15 to FIG. 16). Once the cable 16 is the appropriate length, the button 44 is configured to be inserted within the lock mechanism 14' (see, e.g., FIGS. 16-17). Thus, in the locked state, both the latch 42 and the button 44 may be entirely recessed within the lock mechanism 14' and flush with an outer surface of the lock mechanism.

[0026] The cross sections of FIGS. 23-26 illustrate an embodiment of the lock mechanism 14' and tightening mechanism 18' in more detail. The lock mechanism 14' may house the tightening mechanism 18', however, it is understood that the lock mechanism and tightening mechanism may be integrated as a single assembly in some embodiments. The lock mechanism 14' may include a port 46 for communication with an electronic key 40 and a release mechanism. For example, the port 46 may be configured to receive electrical power from an electronic key 40. The port 46 may be operably engaged with a release mechanism, such as a nitinol wire in engagement with a catch member 48 that is configured to disengage a catch member from the latch 42 in response to communication with the key 40 (e.g., contraction of the nitinol wire moves the catch member). In the locked state, the latch 42 and handle 44 are disposed within the lock mechanism (see, e.g., FIGS. 23 and 26), while in the unlocked state the latch and handle are at least partially extended from the lock mechanism (see, e.g., FIGS. 24-25). The tightening mechanism 18' may further include a rotatable spool 50. The cable 16 is configured to wind on and off of the spool 50 disposed within the lock mechanism 14'. In the locked state, the button 44 may be engaged with the spool 50 such that rotation in a tightening direction (e.g., clockwise

or counterclockwise) causes the cable to be wound on the spool whereas in the unlocked state, the spool is able to freewheel to allow the desired length of cable to be unwound from the spool as the first 12A and second 12B portions of the housing are pulled away from one another. The spool 50 may be a dual spool such that a portion of the cable 16 is configured to be wound on each side of the spool (see, e.g., FIG. 23).

[0027] The tightening mechanism 18' may further include a ratchet mechanism 54 configured to engage a shaft coupling 56 operably engaged with the spool 50. In the locked state, the ratchet mechanism 54 and shaft coupling 56 are in engagement with another to allow the cable 16 to be wound onto the spool but not to be unwound from the spool, which results in tightening of the cable around an item of merchandise M (see, e.g., FIG. 26). In the unlocked state, the ratchet mechanism 54 is disengaged from the shaft coupling 56 which allows the spool 50 to rotate in either a tightening or a loosening direction. In use, disengagement of the catch member 48 releases the latch 42, wherein the latch may be biased towards the unlocked state (e.g., with a spring), which causes the latch to move towards the unlocked state and to disengage the ratchet mechanism 54 from the shaft coupling 56. The handle 44 may also be biased towards the unlocked state (e.g., with a spring) such that each of the latch 42 and the handle are automatically moved to the extended position relative to the lock mechanism 14' when the catch member 48 disengages the latch. The handle 44 may be held in the retracted and locked state by a handle latch 58 that disengages the handle when the latch 42 moves to the unlocked state. When the latch 42 is reinserted into the lock mechanism 14', the ratchet mechanism 54 reengages the shaft coupling 56, and the handle latch 58 reengages the handle 44. In some instances, the latch 42 and the handle 44 may be configured to move linearly between the locked and unlocked states.

[0028] In one embodiment and as discussed above, the merchandise display security device 10 is configured to be operated with an electronic key 40 (see, e.g., FIG. 11). The electronic key may be useable with any security device 10 that utilizes power transferred from the key to operate a mechanical lock mechanism 14 associated with the security device, and/or utilizes data (e.g., a code) transferred from the key to authorize the operation of a mechanical lock mechanism or an electronic alarm circuit. In other words, an electronic key according to embodiments of the invention is useable with any security device 10 or lock mechanism 14 that requires power

transferred from the key to the device and/or data transferred between the key and the device. In some embodiments, power is transferred via inductance or electrical contacts, although any desired power transfer means may be used. According to one aspect, the electronic key does not require a physical force to be exerted by a user on the key to operate the lock mechanism 14 of the merchandise security device. By extension, no physical force is exerted by the electronic key on the lock mechanism 14. As a result, the electronic key cannot be unintentionally broken off in the lock, as often occurs with conventional mechanical key and lock mechanisms. Furthermore, neither the electronic key nor the lock mechanism 14 suffer from excessive wear as likewise often occurs with conventional mechanical key and lock mechanisms, and to a lesser extent, with electronic key and lock mechanisms having exposed electrical contacts.

[0029] In certain embodiments, the merchandise security device 10 is a passive device. As used herein, the term "passive" is intended to mean that the security device 10 does not have an internal power source (e.g., a battery) sufficient to lock and/or unlock a mechanical lock mechanism 14. In addition, the security device 10 may not require an electric motor, such as a DC stepper motor, solenoid, or the like, that is configured to lock or unlock the lock mechanism 14. As such, the security device 10 may employ a simplified lock mechanism 14 that does not require various components operated by its own source of electrical power. In one embodiment, the lock mechanism 14 may be configured to simply receive power from the key without performing any authorization protocol. In other cases, the electronic key may transfer power to the lock mechanism 14, and if a code of the electronic key matches a code of the lock mechanism, the electronic key may operate the security device. As will be readily apparent to those skilled in the art, the electronic key may communicate with the security device 10 by any suitable means, including without limitation, via one or more electrical contacts, or via optical, acoustic, electromechanical, electromagnetic or magnetic conductors, as desired.

[0030] The foregoing has described one or more exemplary embodiments of a merchandise display security device and method. Embodiments of a merchandise display security device have been shown and described herein for purposes of illustrating and enabling one of ordinary skill in the art to make, use and practice the invention. Those of ordinary skill in the art, however, will readily understand and appreciate that numerous variations and modifications of

the invention may be made without departing from the spirit and scope thereof. Accordingly, all such variations and modifications are intended to be encompassed by the appended claims.

That which is claimed is:

1. A merchandise security device for protecting items of merchandise from theft, the merchandise security device comprising:

a housing comprising a first portion and a second portion defining an interior for retaining an item of merchandise therebetween, the first and second portions being movable relative to one another for adjusting a distance between the first and second portions;

a cable configured to operably engage each of the first and second portions; and

a lock mechanism configured to secure the cable relative to the housing to thereby secure the first and second portions relative to one another.

2. The merchandise security device of Claim 1, further comprising a tightening mechanism for changing the tension of the cable to adjust the distance between the first and second portions.

3. The merchandise security device of Claim 2, wherein the tightening mechanism comprises a spool for winding the cable on and off of the spool.

4. The merchandise security device of Claim 1, wherein each of the first portion and the second portion comprises a panel, a sidewall, and top and bottom edges for defining the interior compartment.

5. The merchandise security device of Claim 1, wherein the housing comprises a clear polymeric material.

6. The merchandise security device of Claim 1, wherein the first and second portions are independent components secured together only by the cable.

7. The merchandise security device of Claim 1, wherein the cable is configured to be routed through and between the first and second portions.

8. The merchandise security device of Claim 1, wherein the housing is a container.

9. The merchandise security device of Claim 1, wherein each of the first portion and the second portion comprises one or more channels for receiving the cable.

10. A method for protecting items of merchandise from theft, the method comprising:

inserting an item of merchandise within an interior defined by a first portion and a second portion of a housing, the first and second portions operably engaged with one another with a cable;

moving the first and second portions relative to one another for adjusting a distance between the first and second portions; and

locking a lock mechanism to secure the cable relative to the housing to thereby secure the first and second portions relative to one another.

11. The method of Claim 10, further comprising changing the tension of the cable to adjust the distance between the first and second portions.

ABSTRACT

A merchandise security device is provided. The merchandise security device may include a housing comprising a first portion and a second portion defining an interior for retaining an item of merchandise therebetween, the first and second portions being movable relative to one another for adjusting a distance between the first and second portions. The merchandise security device also includes a cable configured to operably engage each of the first and second portions and a lock mechanism configured to secure the cable relative to the housing to thereby secure the first and second portions relative to one another.

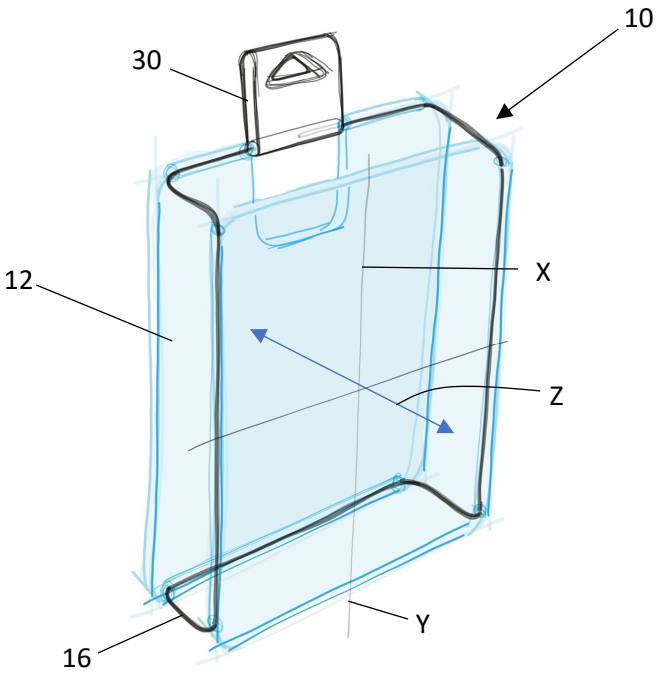


FIG. 1

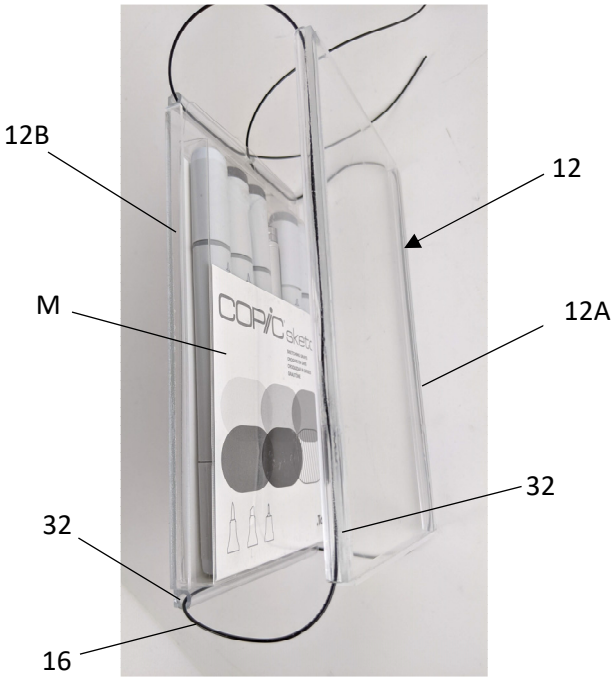


FIG. 2


14
M
12
COPIC sketch
SKETCHING GRAYS
CROQUIS EN GRIS
CROQUIZAR IN GRISES
GRAUTÖNE
.Too

FIG. 3

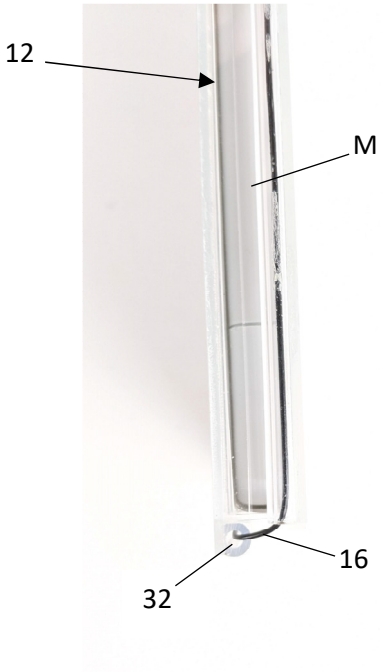
12
M
16
32

FIG. 4


FIG. 5

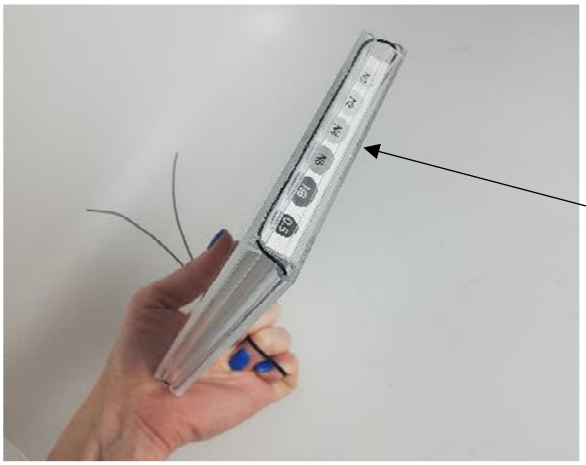


FIG. 6


FIG. 7

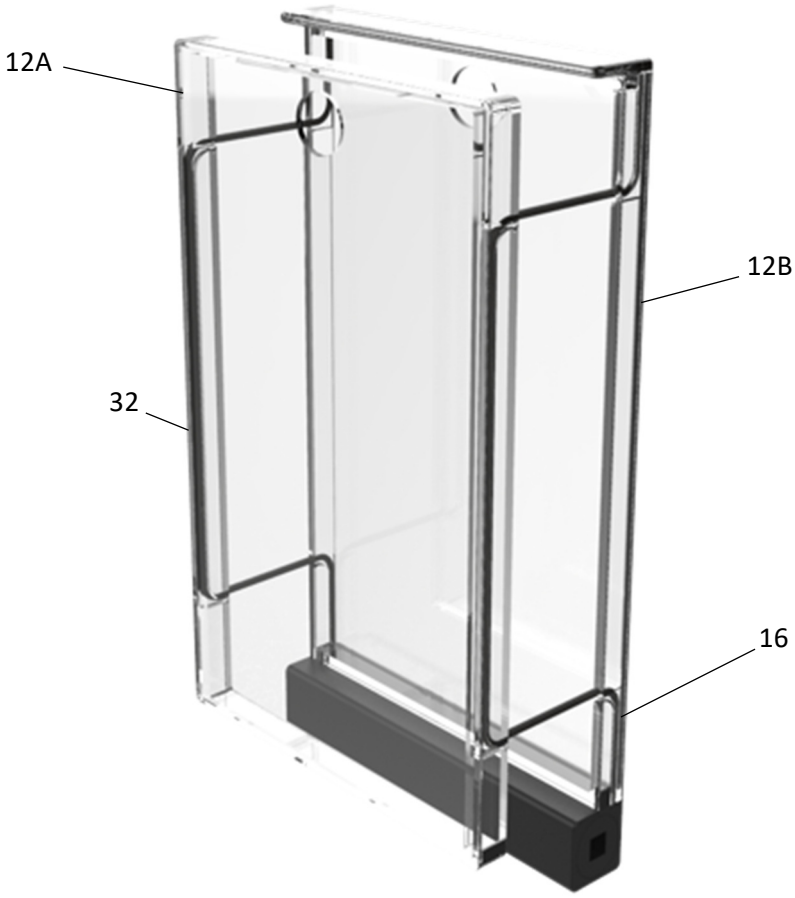


FIG. 8


FIG. 9

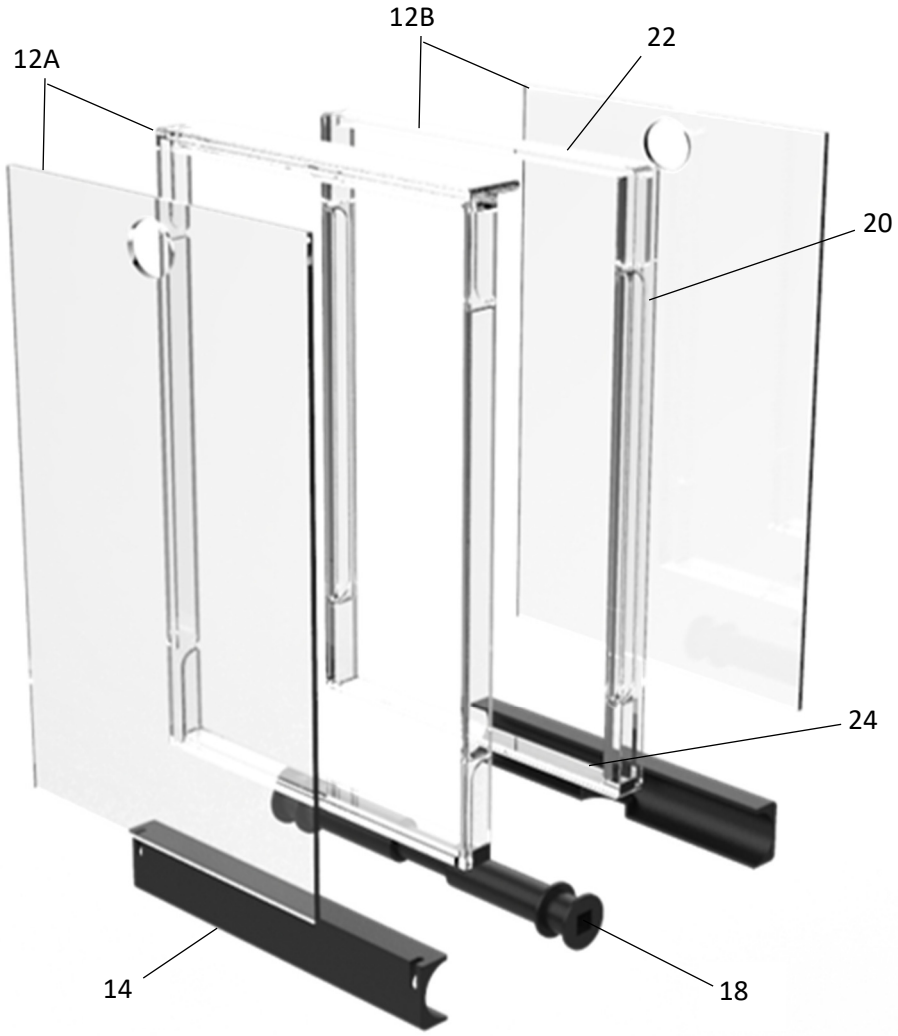


FIG. 10

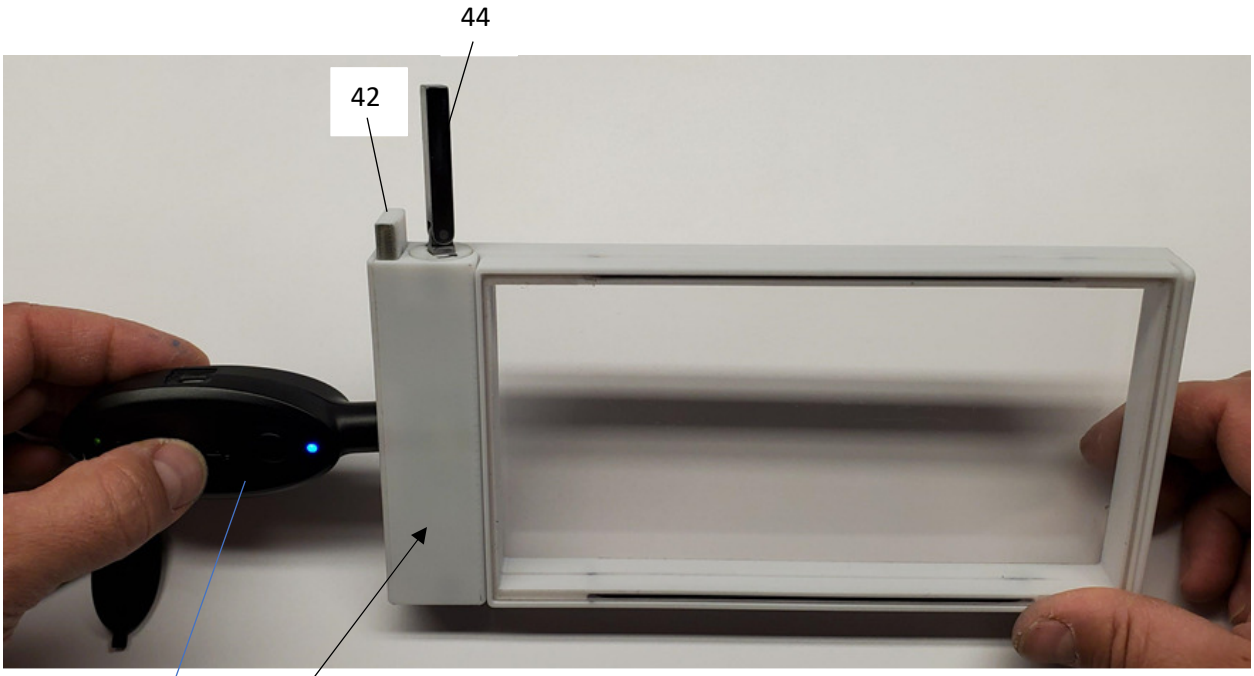


FIG. 11

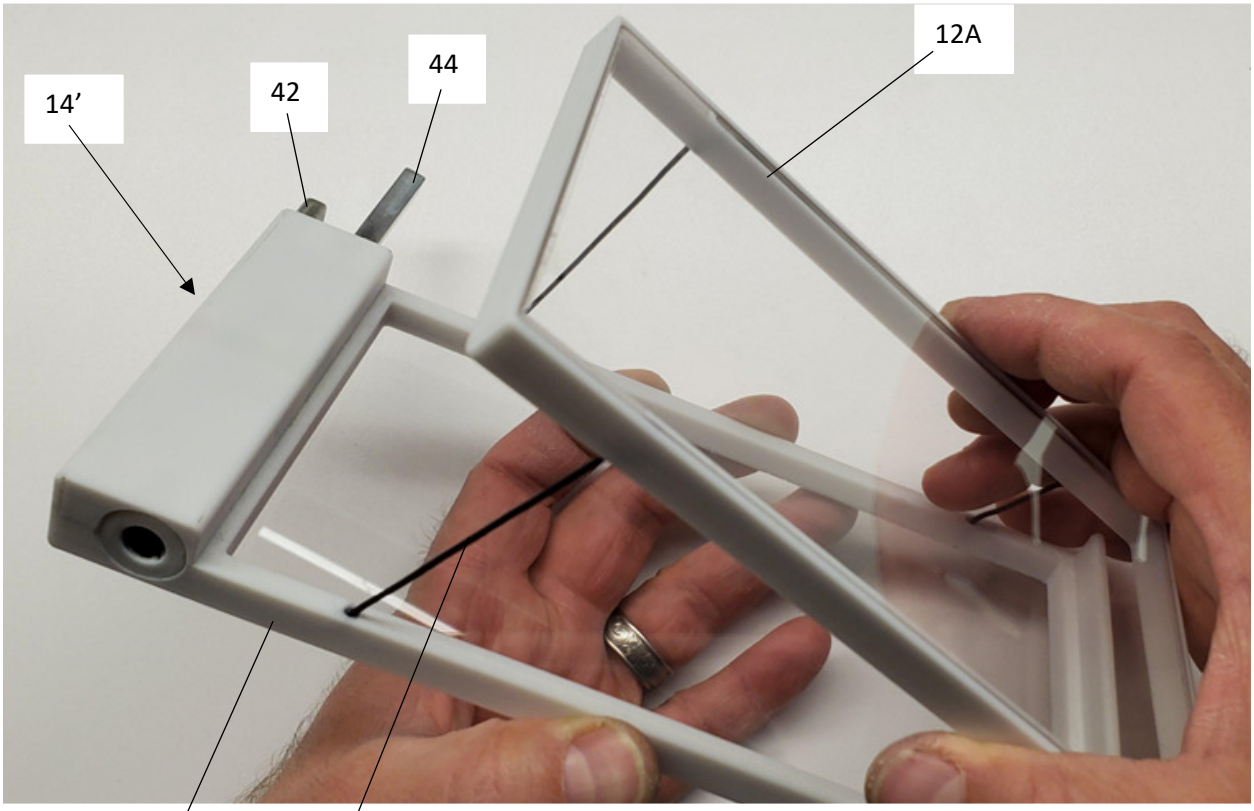


FIG. 12

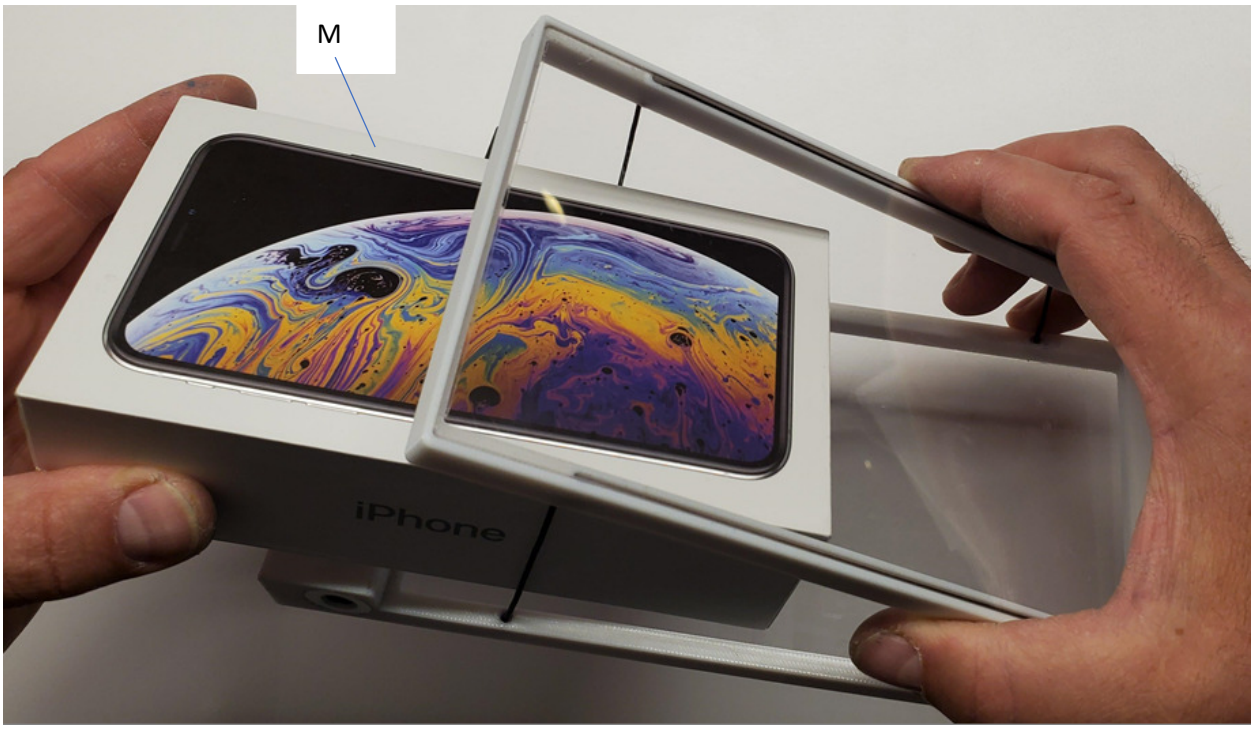


FIG. 13


FIG. 14

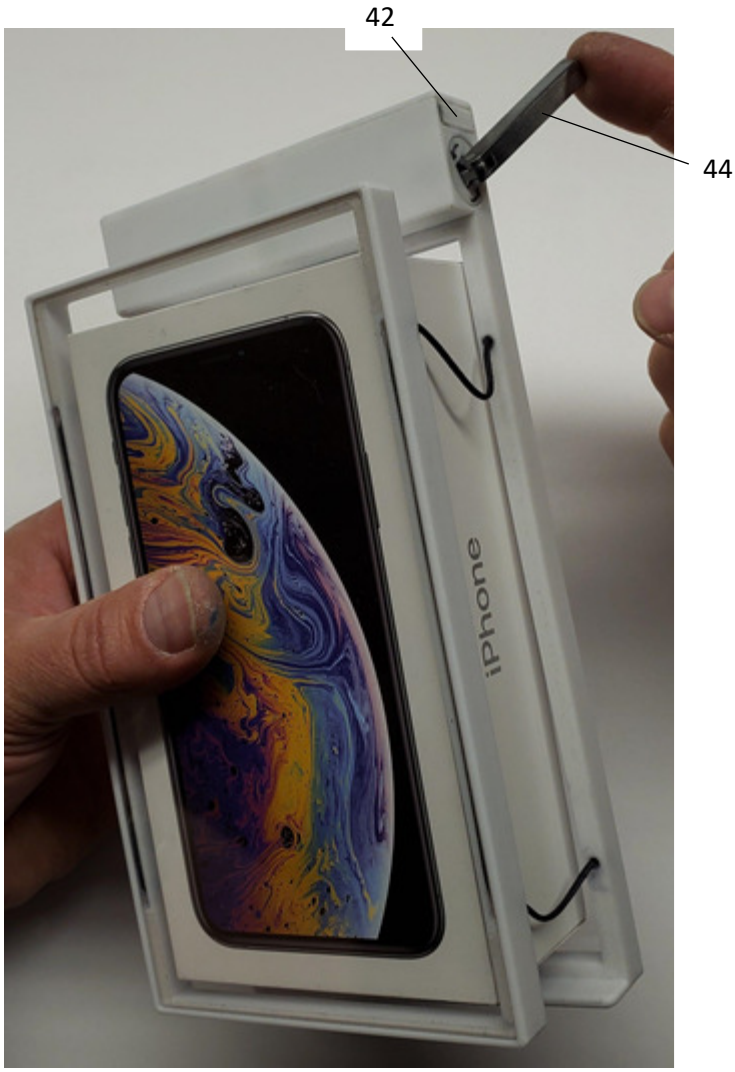


FIG. 15


FIG. 16

FIG. 17

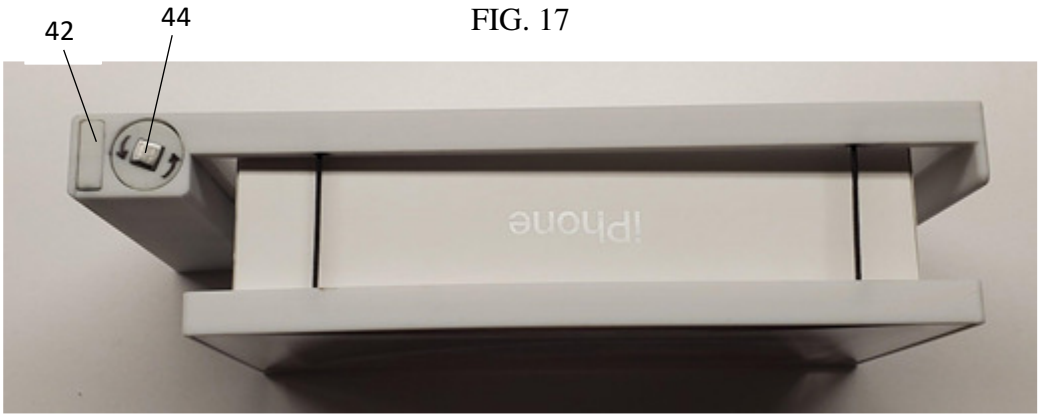


FIG. 18

FIG. 19

FIG. 20

FIG. 21


FIG. 22

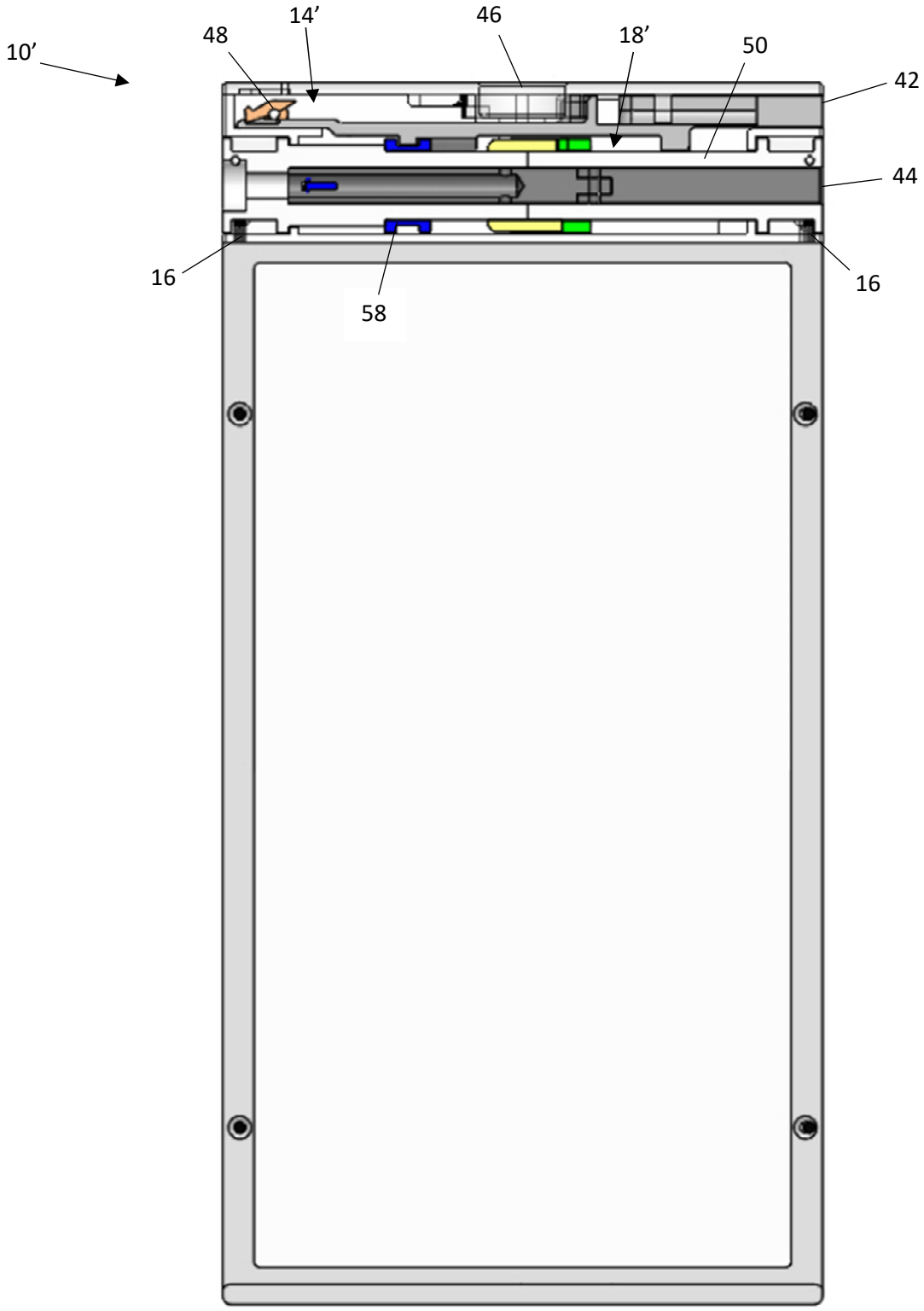


FIG. 23

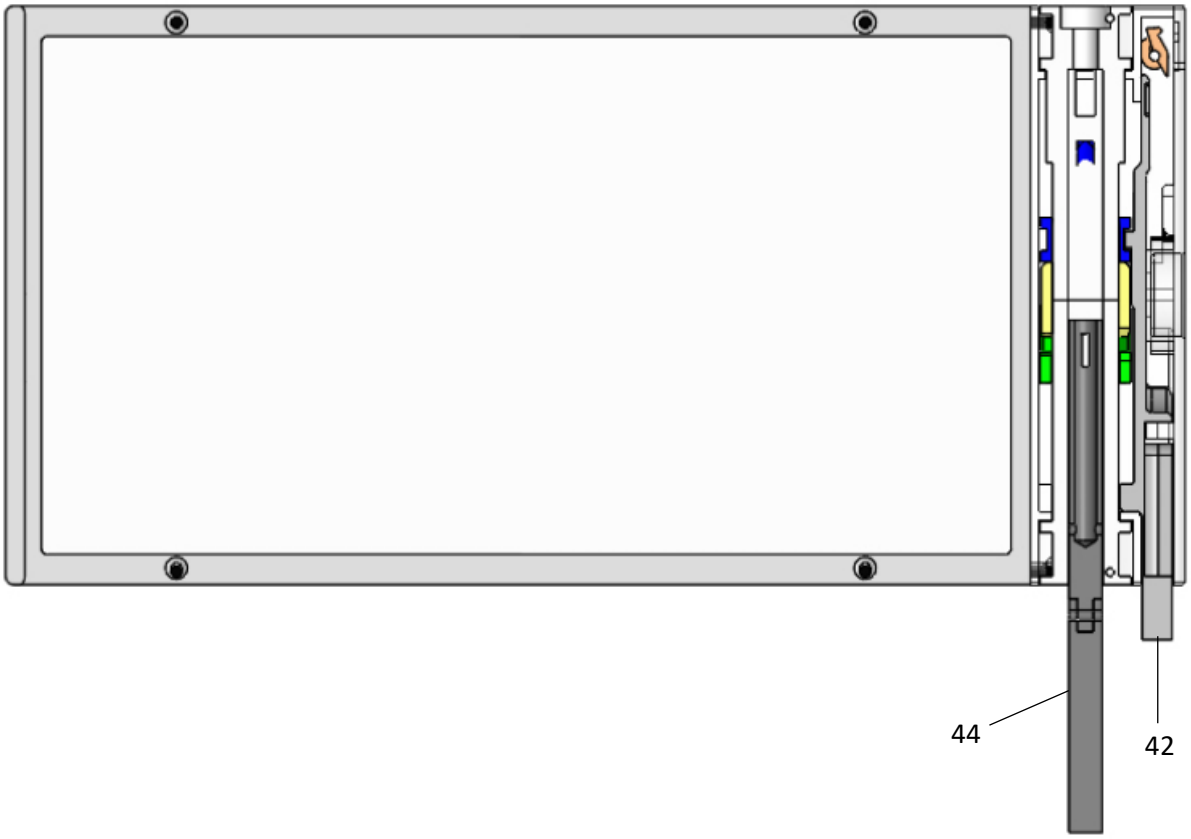


FIG. 24

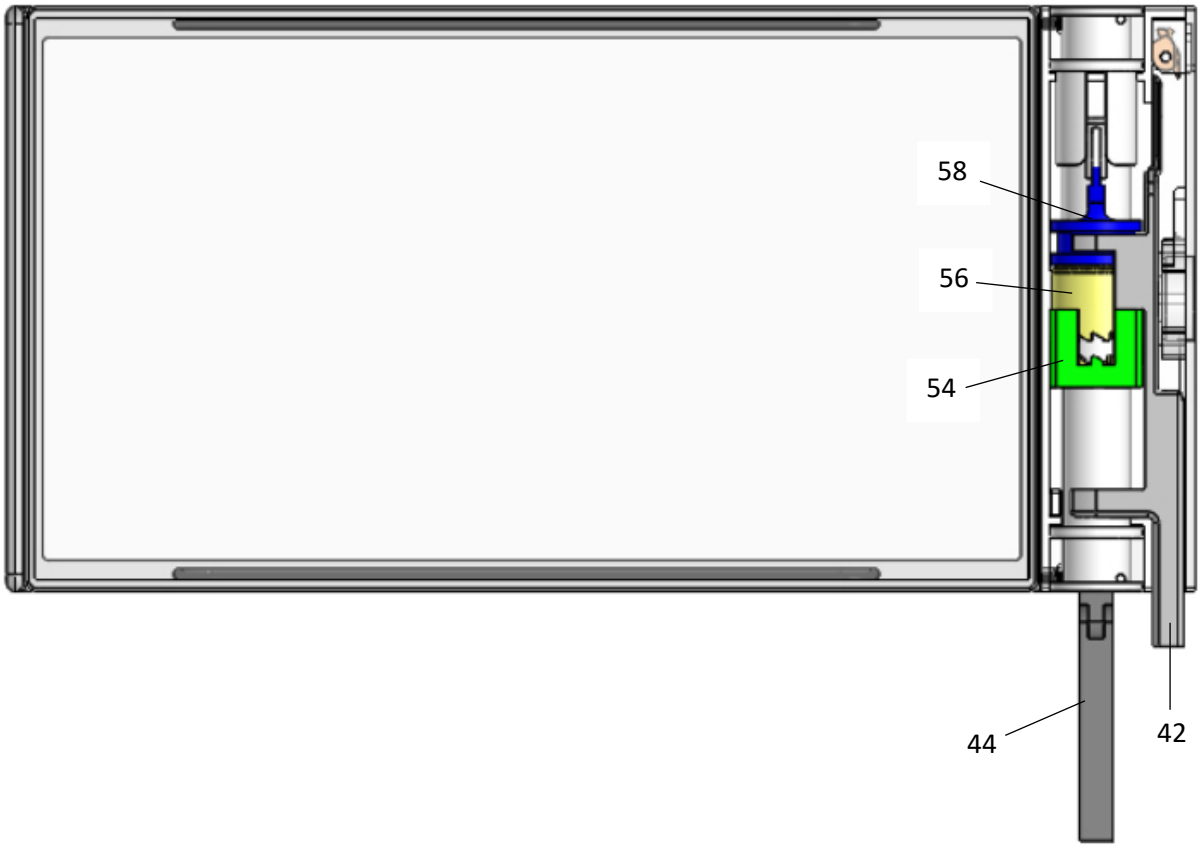


FIG. 25

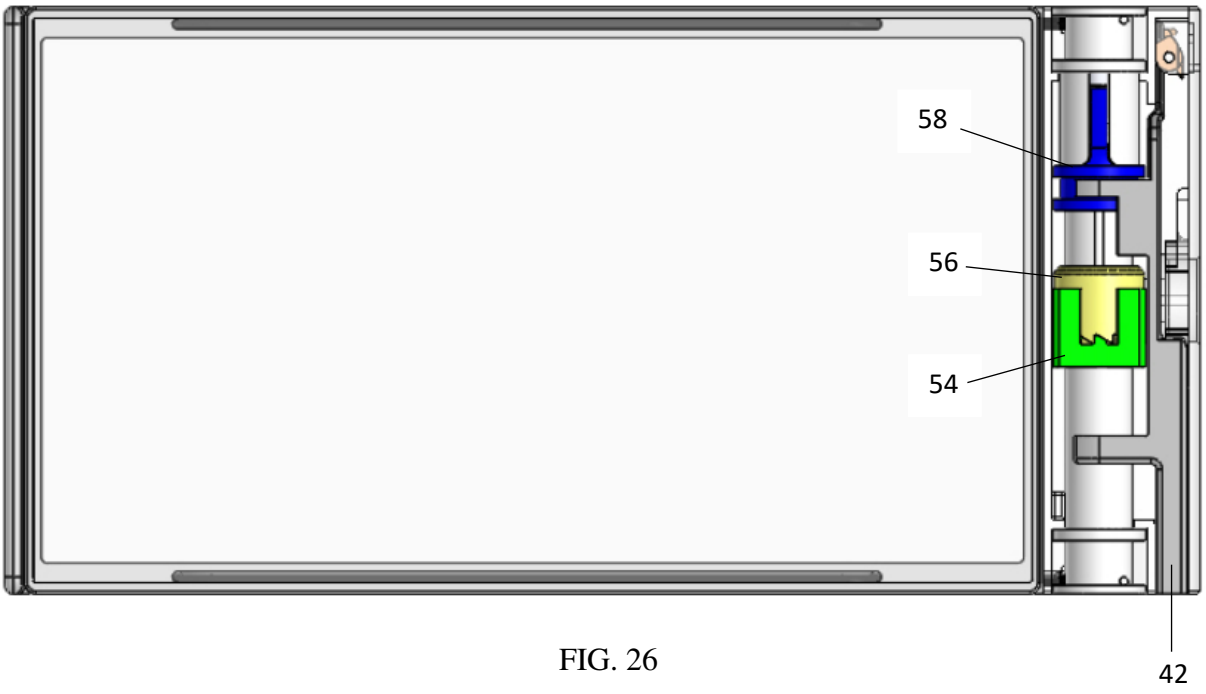


FIG. 26